

REMARKS

This is in response to the Final Action mailed December 29, 2003. The Office Action allowed claim 23, objected to claim 8, and rejected claims 1-3, 5-7, 11-13, 15-21, and 24-27 under 35 U.S.C. § 102, and claim 4 under 35 U.S.C. § 103.

Reconsideration in light of the amendments and remarks made herein is respectfully requested.

Rejections Under 35 U.S.C. § 102

The Office Action rejected claims 1-3, 5-7, 11-13, 15-21, and 24-27 under 35 U.S.C. § 102(b) as being anticipated by Watanabe et al. (hereinafter Watanabe) (U.S. Patent No. 5,801,483).

Based on the telephonic interview conducted with Examiner Tran on March 11, 2004, Applicant herein clarifies the reasons why the prior art fails to teach or suggest the claimed invention.

Applicant submits that the present claimed invention is patentably distinguishable from the teachings in Watanabe. In particular, the prior art discloses a fluorescent lamp only having a phosphor layer to emit visible light. However, the present invention claims a second emissive layer, distinct from a phosphor layer, that emits visible light when exposed to ultraviolet light. Applicant refers the Examiner to Figure 9 (below) and pages 20-23 of the patent application for a clear description of the separate purposes of the phosphor layer and the emissive element. The phosphor layer 42 is found on the inside of the fluorescent lamp 40 while the emissive element is found on a separate middle layer 43 or mixed into the glass tube 41.

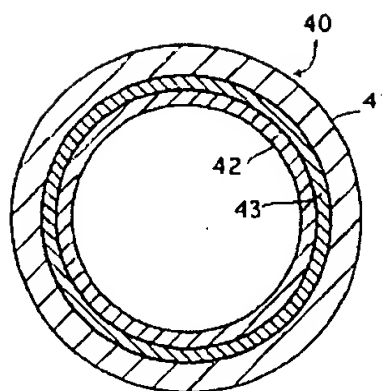
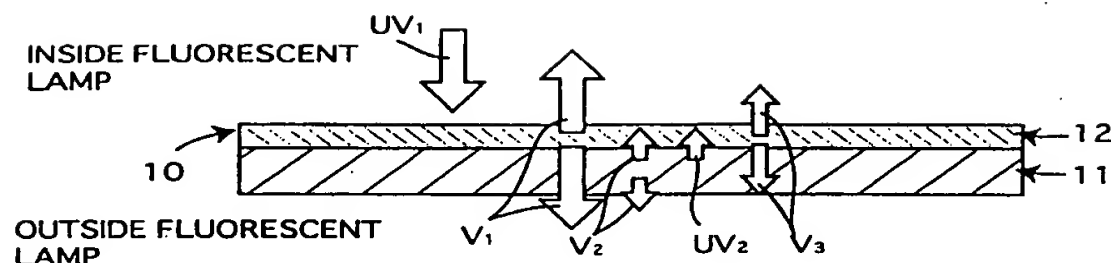


FIG. 9

Figure 3 illustrates an alternative embodiment of the invention where a phosphor layer 12 is deposited on the inside of a fluorescent tube 10 and the emissive element is made part of the outer glass layer 11. As illustrated in Figure 3 (below) and pages 8-11 of the present application, when a gas inside the fluorescent tube 10 is excited, it emits a first ultraviolet light UV1. This UV1 light first reaches the phosphor layer 12, which excites the phosphor layer 12 to produce visible light V1. This visible light V1 forms the main luminous flux from the tube 10. However, in addition to visible light V1, the present invention also provides secondary luminous fluxes V2 and V3. The ultraviolet light UV1 produced inside the fluorescent tube 10 is partially transmitted through the phosphor layer 12 and illuminates the glass tube 11. The emissive element (equivalent to the middle layer in Figure 9) in the glass tube 11 is excited by the transmitted UV1 causing the emissive element to emit a visible light V2 and a near-ultraviolet light UV2. The near-ultraviolet light UV2 emitted by the emissive element partially illuminates the phosphor layer 12 and excites it, which causes the phosphor layer 12 to emit a visible light V3.

FIG.3



Applicant notes that the fluorescent tube 10 includes as phosphor layer 12 and a separate and distinct glass tube 11 which contains the emissive element. Applicant notes that the above described operation of the emissive element is found in various claims, including claim 25 where it recites " ... an emissive element embedded within the fluorescent glass tube having a characteristic of emitting a second visible luminous flux within the fluorescent glass tube when activated by the first ultraviolet light"

Every independent claim currently pending in the application recites the "emissive element" separate and distinct from the phosphor layer. For instance, Claim 1 recites – "a fluorescent tube that is composed of a glass tube having a phosphor layer formed on an inner surface ...wherein the glass tube is made of a glass material that contains an emissive element ..."; Claim 6 recites – "a fluorescent tube that is composed of a glass tube having a phosphor layer formed on an inner surface thereof ... wherein the glass tube is made of a glass material containing an oxide" – where the oxide is an emissive element; Claim 12 recites – "a fluorescent tube having a protective layer formed on an inner surface thereof, a phosphor layer formed on

the protective layer, ... wherein the protective layer contains an oxide of at least one emissive element"; etc.

As can be ascertained from the language of the claims, the phosphor layer is deposited on the inner surface of the glass tube and the glass tube contains (or is impregnated with) the emissive element. That is, the phosphor layer is found on the inside surface of the glass tube and is distinct from the glass tube; the emissive element being impregnated into the glass tube.

Applicant submits that Watanabe fails to teach an emissive element in the glass tube separate and distinct from the phosphor layer as claimed. Watanabe only teaches a phosphor layer (Col. 3, lines 22-42), it does not teach an emissive element layer that has a second emission of visible light as claimed. Because the claim language clearly distinguishes between the location of the phosphor layer (e.g., layered on the inner surface of the glass tube) and the different location of the emissive element (e.g., impregnated as part of the glass tube), the phosphor layer in Watanabe cannot be considered the distinct emissive element claimed.

Applicant also notes that Watanabe does not teach or suggest " ... an emissive element embedded within the fluorescent glass tube having a characteristic of emitting a second visible luminous flux within the fluorescent glass tube when activated by the first ultraviolet light" as claimed in claim 25 for instance.

For at least these reasons, Applicant submits that claims 1-3, 5-7, 11-13, 15-21, and 24-27 are patentably distinguishable from the cited prior art.

Applicant respectfully requests that the 35 U.S.C. § 102(e) rejection be withdrawn.

Rejections Under 35 U.S.C. § 103

The Final Office Action rejected claim 4 under 35 U.S.C. § 103 as being unpatentable over Watanabe.

For the reasons cited above, Applicant submits that all dependent claims are in condition of allowance. In particular, because the independent claims recite an emissive element, separate and distinct from the phosphor layer, the claims are not taught or suggested by the cited prior art.

Applicant respectfully request that the 35 U.S.C. § 103 rejection be withdrawn.

Claim Objections

The Final Office Action indicated the subject matter of Claim 8 would be allowed if rewritten in independent form. Applicant respectfully requests that the re-writing of dependent Claim 8 be held in abeyance.

Allowed Claims

Applicant also notes with appreciation the indication of allowance of Claim 23.



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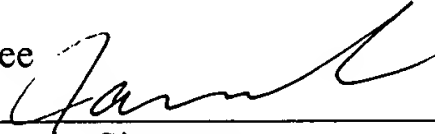
Conclusion

In view of the amendments and remarks made above, it is respectfully submitted that the pending claims are in condition for allowance, and such action is respectfully solicited. Authorization is hereby given to charge our Deposit Account No. 19-2814 for any charges that may be due. Furthermore, if an extension is required, then Applicants hereby request such an extension.

Respectfully submitted,

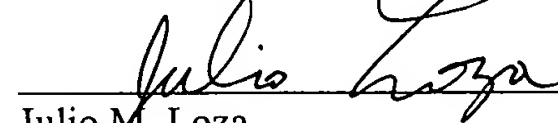
I hereby certify that this document is being deposited on March 15, 2004 with the U.S. Postal Service as first class mail under 37 C.F.R. 1.8 and is addressed to, Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450.

By: James Lee



Signature

Snell & Wilmer L.L.P.



Julio M. Loza
Registration. No. 47,758
1920 Main Street
Suite 1200
Irvine, CA 92614
Telephone: (949) 253-4924

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